substantially a reversed direction of rotation of polarization. The power of the reflected beam will vary depending on whether or not the area of the recording layer on which the beam is focused, contains a previously-written spot. The reflected beam retraces its path through the objective lens 1706, prism 1705 and along substantially the same path 1712, Upon reaching the retarder 1704, the beam is converted to a horizontal linear polarization. When it encounters the birefringent component 1703, the beam shears in a horizontal direction, 1716, exiting the birefringent component as beam 1711, parallel to the original beam 1710, but displaced by a small amount 1812, such as about 100 to 200 micrometers. When the reflected beam enters the optic component 1702, it encounters an astigmatic element 1708, such as a cylindrical lens, before being projected onto the detector array 1714. If the astigmatic element 1708 is a cylindrical lens, then the detector array 1714 should be a conventional quadrant configuration.

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IN THE CLAIMS

Please cancel Claims 45, 54 and 76 and rewrite the remaining claims to read as follows.

11. (Amended) A method for optically recording data, comprising:

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providing a user-removable cartridge having a optical first-surface recording medium mounted therein for rotation about a first axis, configured to provide optical access to at least a first arcuate region of said medium, said first-surface recording medium comprising a phase-change recording layer;

positioning said cartridge in a location adjacent an optical arm, said optical arm having an objective end and rotatable about a second axis;

rotating said optical arm about said second axis to position said objective end aligned with a plurality of desired arcuate positions along said arcuate region;

rotating said medium about said first axis to position a plurality of desired medium positions in alignment with said objective end; and

providing laser light along said optical arm to said objective end for diverting from said objective end to said plurality of desired medium positions in said recording layer, said laser light causing said recording layer to change from an amorphous phase to a crystalline phase at said medium positions.

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12. A method, as claimed in claim 11 wherein said cartridge provides a first shutter movable, via a mechanical linkage, from a first position, substantially sealing said medium in said cartridge, to a second position, exposing at least said first arcuate region of said medium.

13. A method, as claimed in claim 12, wherein, in response to said positioning, said linkage automatically moves said shutter to said second position

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14. (Amended) A method for optically reading comprising:

providing a user-removable cartridge having a optical first-surface medium mounted therein for rotation about a first axis, configured to provide optical access to at least a first arcuate region of said medium, said medium containing data formed in a recording layer of said medium by stamping and/or molding during the manufacture of said medium;

positioning said cartridge in a location adjacent an optical arm, said optical arm having an objective end and rotatable about a second axis;

rotating said optical arm about said second axis to position said objective end aligned with a plurality of desired positions along said arcuate region;

rotating said medium about said first axis to position a plurality of desired medium positions in alignment with said objective end; and

providing laser light along said optical arm to said objective end for diverting from said objective end to said plurality of desired medium positions; and

detecting at least a first characteristic of light reflected from said desired medium positions.

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28. (Amended) Apparatus for recording data, comprising:

a cartridge having a optical first-surface recording medium mounted therein for rotation about a first axis, and defining a first shutter movable, via a mechanical linkage, between a first position, substantially sealing said medium in said cartridge, and a second position, exposing at least a first arcuate region of said medium, means for assisting in positioning said cartridge in a location adjacent an optical arm, said optical arm having an objective end and rotatable about a second axis, wherein, in response to said positioning, said linkage automatically moves said shutter to said second position;

means for rotating said optical arm about said second axis to position said objective end aligned with a plurality of desired positions in said arcuate region; means for rotating said

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medium about said first axis to position a plurality of desired medium positions in alignment with said objective end; and means for providing laser light along said optical arm to said objective end for diverting from said objective end to said plurality of desired medium positions,

wherein said medium contains a recording layer comprising a material that changes from an amorphous phase to a crystalline phase when exposed to thermal energy.

29. (Amended) Apparatus for reading optical data, comprising:

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a cartridge having an optical first-surface medium mounted therein for rotation about a first axis, and defining a first window exposing at least a first arcuate region of said medium, means for assisting in positioning said cartridge in a location adjacent an optical arm, said optical arm having an objective end and rotatable about a second axis; means for rotating said optical arm about said second axis to position said objective end along said arcuate region;

means for rotating said medium about said first axis to position a plurality of desired medium positions in alignment with said objective end;

means for providing laser light along said optical arm to said objective end for diverting from said objective end to said plurality of desired medium positions; and

means for detecting changes in an intensity of light reflected from said medium.

30. Apparatus as claimed in claim 29 wherein said medium contains pre-recorded data.

44. (Amended) A drive for reading data on an optical media disk, said disk defining a plane, comprising: a spin drive for rotating said disk about a first axis;

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an arm, having an objective end, mounted for rotating said arm about a tracking axis to position said objective end in alignment with any of a plurality of radial positions of said disk, said tracking axis being substantially parallel to and spaced from said first axis, said objective end being spaced from said disk a distance of at least about 50 micrometers; and

a laser light source configured to provide laser light along a path to said objective end of said arm and thence to said disk; and

an optical detector which detects light reflected from said disk;

wherein said arm is further mounted for controllably moving said objective end along a path to adjust the distance of said objective end from said disk for focusing said laser light.

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46. A drive, as claimed in claim 44, wherein moving said arm for focusing is performed while maintaining said objective end and said laser light source in a substantially constant spatial relationship with respect to one another.

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47. A drive, as claimed in claim 44, wherein said arm is mounted to provide for translation of said arm in a direction substantially parallel to said first axis.

48. A drive, as claimed in claim 44, wherein said arm is mounted to provide for pivoting of said arm about an axis substantially parallel to the plane of said disk.

49. A drive, as claimed in claim 44, wherein said drive has a mass less than or equal to about 0.05 kg.

50. (Amended) A drive, as claimed in claim 44, wherein said drive fits within a rectangular envelope having a thickness less than or equal to about 12 mm.

51. A drive, as claimed in claim 44, wherein said drive fits within a rectangular envelope having a width less than or equal to about 60 mm.

52. A drive, as claimed in claim 44, wherein said drive fits within a rectangular envelope having a depth of less than or equal to about 50 min.

53. A drive, as claimed in claim 44 further comprising a drive controller interface, wherein said drive controller interface is a universal serial bus interface.

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55. An optics assembly for use in conjunction with an optical data disk, comprising:

a vertical cavity surface emitting laser (VCSEL);

a light detector; and

an optical relay system which guides at least some laser light from said VCSEL to a selectable region of said optical data disk and which guides at least a portion of reflected light from said optical data disk to said light detector.

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56. An optics assembly as claimed in claim 55 wherein said VCSEL and said light detector are formed on a single integrated circuit substrate.

57. An optics assembly as claimed in claim 55 wherein said VCSEL and said light detector are mounted on a single substrate.

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58. Apparatus for use in connection with optical data storage, comprising:

a storage medium wherein data bits written thereon bits can be distinguished using reflected light, reflected from said storage medium;

a laser light source;

a detector,

an optical relay system which guides at least some laser light from said laser light source to a selectable region of said storage medium and which guides at least a portion of said reflected light from said storage medium to said detector,

wherein said laser light source and said detector are formed on a single integrated circuit substrate.

59. Apparatus, as claimed in claim 58, wherein said laser light source includes a surface emitting laser.

60. Apparatus, as claimed in claim 58, wherein said laser light source includes at least a first vertical cavity surface emitting laser (VCSEL).

61. Apparatus, as claimed in claim 60, wherein said VCSEL is used as at least part of said detector.

62. Apparatus, as claimed in claim 61, wherein said detector comprises a substantially radially symmetric arrangement which is substantially concentric with said laser light source.

63. Apparatus, as claimed in claim 61, wherein said detector is laterally spaced a first distance from said laser light source.

64. Apparatus, as claimed in claim 63, further comprising a birefringent material sized and shaped to laterally offset a reflected beam from said laser light source by said first distance.

65. Apparatus, as claimed in claim 63, wherein said first distance is less than or equal to about 0.05 mm.

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66. Apparatus, as claimed in claim 61, wherein said apparatus occupies a volume defining a form factor of less than or equal to about 60 mm in width, less than or equal to about 12 mm in height and less than or equal to about 50 mm in depth.

67. Apparatus, as claimed in claim 61, wherein said storage medium is a rotatable disk.

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68. Apparatus, as claimed in claim 67, configured to facilitate end-user removal and replacement of said disk.

69. Apparatus as claimed in claim 67, wherein said rotatable disk is at least partially covered by a cartridge.

70. Apparatus as claimed in claim 69, configured to facilitate end-user removal and replacement of said cartridge and disk.

71. Apparatus, as claimed in claim 61, wherein said detector provides a data signal.

72. Apparatus, as claimed in claim 61, wherein said detector provides a focus error signal.

73. Apparatus, as claimed in claim 61, wherein said detector provides a tracking error signal.

74. Apparatus, as claimed in claim 61, wherein said detector is a phi-detector.

75. (Amended) Apparatus for optical data storage comprising:

a rotatable, user-removable disk;

a drive, couplable to said disk, for rotating said disk about a first axis;

an optics arm having at least a laser source, a detector, an objective and a focus actuator,

and defining an objective end and a second end;

a tracking actuator, coupled to said arm to controllably rotate said arm about a second axis, substantially parallel to, but spaced from said first axis, to position said objective end at desired radial locations adjacent said disk,

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wherein the location and mass of components of said arm are such that said rotation about said second axis imparts a moment of inertia of less than or equal to about 5 gm-cm^2.

77. Apparatus as claimed in claim 75 wherein the location and mass of components of said arm are such that said rotation about said second axis imparts a moment of inertia of less than or equal to about 1 gm-cm^2.

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78. Apparatus as claimed in claim 75 further comprising a prism.

79. Apparatus, as claimed in claim 78, wherein said focus actuator adjusts the distance of said detector from said prism.

80. Apparatus, as claimed in claim 75, wherein said focus actuator adjusts the distance of said objective end from said disk.

81. Apparatus, as claimed in claim 75, wherein said focus actuator comprises a piezo-motor.

82. Apparatus, as claimed in claim 75, wherein said laser source, detector and objective are all positioned with respect to said optics arm on the same side of said second axis.

83. Apparatus, as claimed in claim 82, wherein said laser source, detector and objective are all positioned substantially adjacent said objective end of said optics arm.

84. Apparatus, as claimed in claim 75 wherein each of said laser source and objective defines an optical axis and wherein the optical axes of said laser source and objective are coaxial.

85. Apparatus for optical data storage comprising:

a rotatable, user-removable disk;

a drive, couplable to said disk, for rotating said disk about a first axis;

an optics system having at least a laser source, a detector, and an objective;

a focus actuator for moving at least a portion of said optics system for adjusting focus of light from said laser source on said disk, wherein said moving is performed while

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maintaining at least said laser source and said objective in a fixed spatial relationship with respect to one another.

86. Apparatus, as claimed in claim 85, wherein a distance, along an optical path from said laser source to said objective, remains substantially constant during said moving for adjusting focus.

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87. Apparatus for optical data storage comprising:

a user-removable disk, rotatable about a first axis, to define a disk plane;

a drive, couplable to said disk, for rotating said disk about a first axis;

an optics arm having at least a laser source, a detector, and an objective;

a focus actuator for controllably pivoting said optical arm about an axis substantially parallel to said disk plane for adjusting focus of light from said laser source on said disk.

88. Apparatus for optical data storage comprising:

a user-removable disk, rotatable about a first axis, to define a disk plane;

a drive, couplable to said disk, for rotating said disk about a first axis;

an optics arm having at least a laser source, a detector, and an objective;

a focus actuator for controllably translating said optical arm in a direction substantially parallel to said first axis for adjusting focus of light from said laser source on said disk.

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95. A drive for reading or writing data from or to an optical data recording disk, said drive having a thickness less than or equal to about 12 mm, a width less than or equal to about 55 mm and a depth less than or equal to about 40 mm.

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99. (New) A method, as claimed in claim 11, comprising detecting a difference in a first reflectivity of said recording layer at said medium positions and a second reflectivity of said recording layer at other positions on said recording layer.

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